

OMR 700
PAPERLESS RECORDER





PAPERLESS RECORDER OMR 700

Modular data recorder with 8 positions for plug-in cards:

- analogue inputs, max. 12 inputs/module
- digital inputs, max. 12 inputs/module
- analogue outputs, max. 4 outputs/module
- digital outputs, max. 10 outputs/module
- data outputs

Basic features of the recorder:

- color TFT display 5,7" with a capacitive panel
- primary and backup system
- digital inputs and outputs
- record into internal memory, SD card or USB Flash
- Ethernet 10/100B, RS 485 – Modbus
- USB, microUSB
- internal data memory 2x 512 MB
- sound module
- RTC
- size 150 x 150 mm
- cover IP64
- power source 80...250 V AC/DC

INTRODUCING THE RECORDER

Company ORBIT MERRET launches a new product in its portfolio: Paperless recorder OMR 700.

This recorder is intended for technologies and workings where it is needed to display and/or record a number of electrical and nonelectrical values at one place. Universality, versatility and in particular good value for money predestine the recorder to fulfil most of your demanding needs including the IP64 front panel cover.

Our paperless recorder has been developed with versatility and intuitive control in mind. Thanks to its modularity the user can insert input or output cards into any of the 8 existing slots. Maximal configuration of the recorder thus allows to measure and record up to 96 inputs. In order to increase reliability, the recorder has two systems - primary and backup.

Always on board are digital control inputs and outputs, serial line RS 485, Ethernet 10/100, USB connector as well as 512 MB internal memory to record the measured data.

PROJECTION

Color 5,7" TFT display with fine resolution dominates the device. The display is multi-touch and it therefore allows an ease of use.

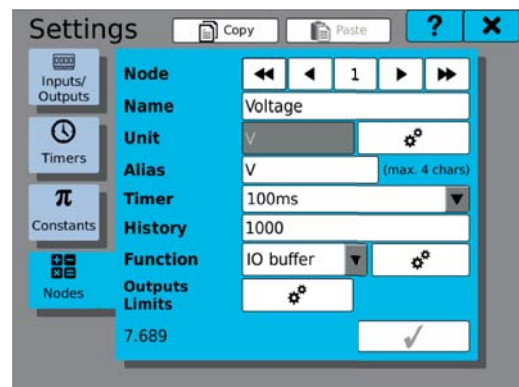
CONTROL

Recorder is controlled by both the touch screen and the push buttons with adjustable functions, positioned underneath a sliding front door.

Two LEDs indicate run/error and state of data recording.

SETTING

All functions and settings can be performed directly on the instrument's display in a clear graphical menu.



DATA RECORDING

The OMR 700 can record measured data from any of its active inputs, nodes and mathematical functions. Data are stored in the internal 512 MB memory with compression that allows up to four-fold increase of its physical memory without slowing down. Data can also be stored on an external SD card or USB flash drive.

In case of a limited number of measuring inputs, measurement data can be stored with a period of up to 1 ms.

The records can be either in BIN or „CVS“ format. However, the latter is much more demanding on memory.

Recording speed according to number of channels / memory space

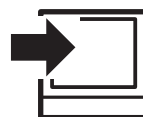
Recording speed	16 inputs	48 inputs	80 inputs	96 inputs
1 ms	2 hours	x	x	x
10 ms	20 hours	7,5 hours	x	x
1 s	2,5 months	1 month	16 days	13 days
1 min	13 years	5 years	2,5 years	2,2 years
10 min	132 years	52 years	26 years	22 years

MODULES

The development of the device has been performed with an increased emphasis on technical solutions and universality. Card design not only allows their use in any position of the recorder, but also their additional insertion into vacant slots. Thus, if new requirements to increase the number or type of inputs and outputs occur in the course of using the recorder, just order another card and insert it into a vacant slot. In this way the instrument can „grow“ in compliance with your requirements.

All analogue modules are fully isolated from the internal bus, and some cards have galvanic isolation even between individual channels.

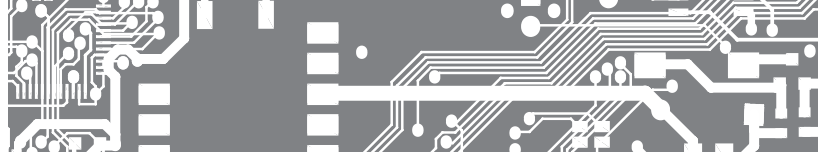
Basic version of the recorder includes power supply module and communication module with Ethernet 10/100, RS 485 (ASCII, MODBUS), five digital inputs and two digital outputs.



- 3x universal - DC, PM, OHM, RTD, Ni, Cu, T/C, DU
- 12x DC - voltage/current input
- 4x/5x RTD input - Pt xxx, Ni xxx, Cu xxx
- 4x T/C input - J/K/T/E/B/S/R/N/L
- 2x DMS - input for strain gauges
- 3x DC - precise voltage and current input
- 2x AC/PWR - voltage/current/power/frequency
- 12x digital input 10...250 V AC/DC
- 12x input counter/frequency
- 2x input Up/DW counter/frequency/IRC



- 4x relay with switch-over contact
- 8x relay with switch-on contact
- 8x open collector NPN
- 16x open collector NPN
- 8x open collector PNP
- 6x SSR
- 2x/4x analogue output
- 1x PROFIBUS
- 1x PROFINET



...AND ON TOP OF IT

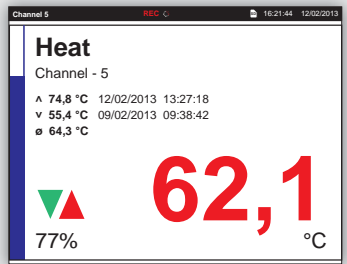
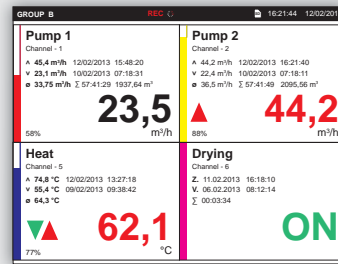
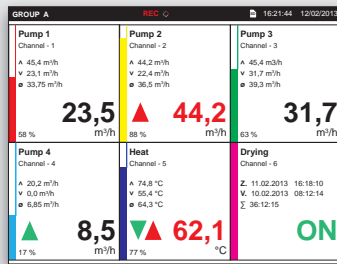
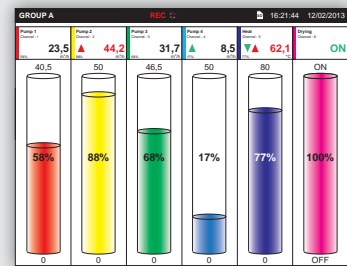
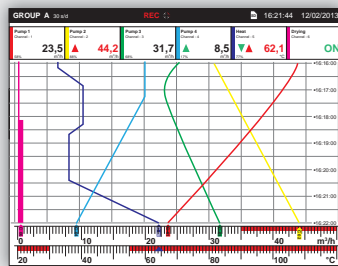
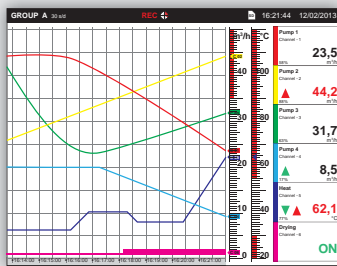
Under the hinged lid, which can be opened by a light pressure upon the blue riders, there is access to control push buttons, microUSB for recorder setting via PC, SD card slot, and USB Flash drive connector. In the bottom right corner you will find a Stylus for easier control of the recorder and and for displaying drawings.

Cover of the lid is IP64 so that your recorder, SD card, and USB Flash drive will always stay dry.

If necessary, a seal can be fitted to the hinged lid as a mechanical security against possible accidental opening. Your SD card or USB Flash drive will remain safely stored.



PROJECTION



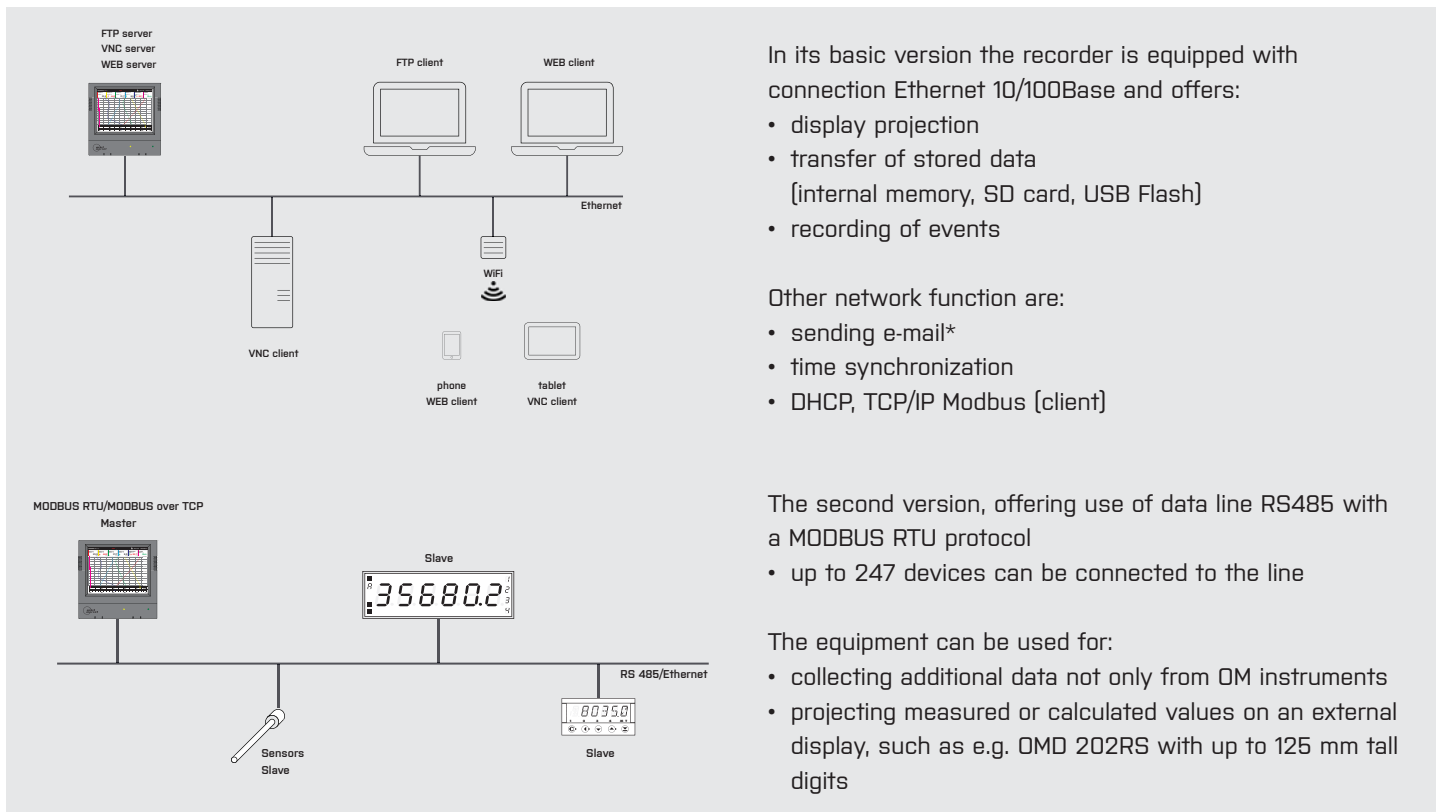
RECORDING OF EVENTS

Pos.	Event	Date	Time
01	Switching on	18/01/2013	07:12:15
02	Insert SD card	22/01/2013	09:18:10
03	Insert USB Flash	31/01/2013	14:32:35
04	Change setting - User 1	04/02/2013	10:41:52

No.	Event	Value	Date	Time
01	Pump 2	Flow	20/01/2013	08:11:19
02	Heat	Temperature	20/01/2013	11:18:22
03	Pump 2	Flow	29/01/2013	16:22:30
04	Heat	Temperature	03/02/2013	13:45:52
05	Heat - info@service.eu	Temperature	03/02/2013	13:45:52
06	Pump 4	Flow	16/02/2013	12:51:38
07	Pump 4 - User 1	Flow	16/02/2013	12:55:52

Channel	Tag/Value	Source Tag	Date	Time
01	Pump 1	Flow	20/01/2013	08:11:19
A	45.4 m³/h		10/02/2013	15:48:20
V	23.1 m³/h		29/01/2013	07:18:31
Σ	33.75 m³/h			
Σ mean	1937.64 m³ / 2 5741.29			
Σ	31937.64 m³ / 2 4657.41			
02	Pump 2	Flow	20/01/2013	08:11:19
A	44.2 m³/h		12/02/2013	16:21:40
V	22.4 m³/h		10/02/2013	07:18:11
Σ	36.5 m³/h			
Σ mean	2095.56 m³ / 2 5741.49			
Σ	42837.64 m³ / 2 4657.22			

DATA CONNECTION



In its basic version the recorder is equipped with connection Ethernet 10/100Base and offers:

- display projection
- transfer of stored data (internal memory, SD card, USB Flash)
- recording of events

Other network function are:

- sending e-mail*
- time synchronization
- DHCP, TCP/IP Modbus (client)

The second version, offering use of data line RS485 with a MODBUS RTU protocol

- up to 247 devices can be connected to the line

The equipment can be used for:

- collecting additional data not only from OM instruments
- projecting measured or calculated values on an external display, such as e.g. DMD 202RS with up to 125 mm tall digits

BENCHTOP AND OUTDOOR VERSIONS

OMA 710 is a portable bench top laboratory housing. The type and layout of connectors at the rear of the housing are identical to that of paperless recorder OMR 700.



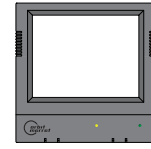
OMA 710



OMA 713

OMA 713 is a portable heavy duty housing for the OMR 700 designed for the most demanding environments. It resists dust, humidity and can withstand complete flooding.

The portable housing is fitted with IP 67 rated connectors, which enables the recorder to be used under harsh conditions.



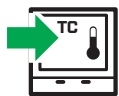
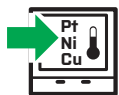
Digital inputs
5x

HTTP/FTP/MODBUS over TCP/email

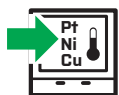
Ethernet
Standard equipment



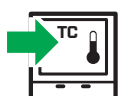
IN.1 3x Universal input, isolated
DC: $\pm 60/\pm 150/\pm 300/\pm 1\ 200$ mV
PM: 0...5 mA/0...20 mA/4...20 mA ± 2 V/ ± 5 V/ ± 10 V/ ± 40 V
OHM: 0...100 Ω /0...1/10/100 k Ω /Auto
RTD: Pt 50/100/Pt 500/Pt 1 000
Cu: Cu 50/Cu 100
Ni: Ni 1 000/Ni 10 000
T/C: J/K/T/E/B/S/R/N/L
DU: Linear potentiometer (min. 500 Ω)



IN.2 4x 0...5/20 mA/4...20 mA,
 $\pm 2/\pm 5/\pm 10/\pm 40$ V, isolated
IN.6 12x 0...5/20 mA/4...20 mA
IN.7 12x $\pm 2/\pm 5/\pm 10/\pm 40$ V
IN.9 3x 0/4...20 mA; $\pm 5/\pm 10$ V, isolated



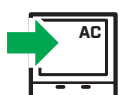
IN.3 4x input for Pt/Ni/Cu xxxx, isolated
2- and 3-wire connection, isolated
IN.5 5x input for Pt/Ni/Cu xxxx
2- and 3-wire connection



IN.4 4x input for thermocouples, isolated
J/K/T/E/B/S/R/N/L
with cold junction compensation



IN.8 2x input for strain gauges, isolated
range: 1...2/8/16 mV/V
with sensor power supply



IN.10 2x AC/PWR input, isolated
0...450 V/0...5 A
voltage, current, power, frequency

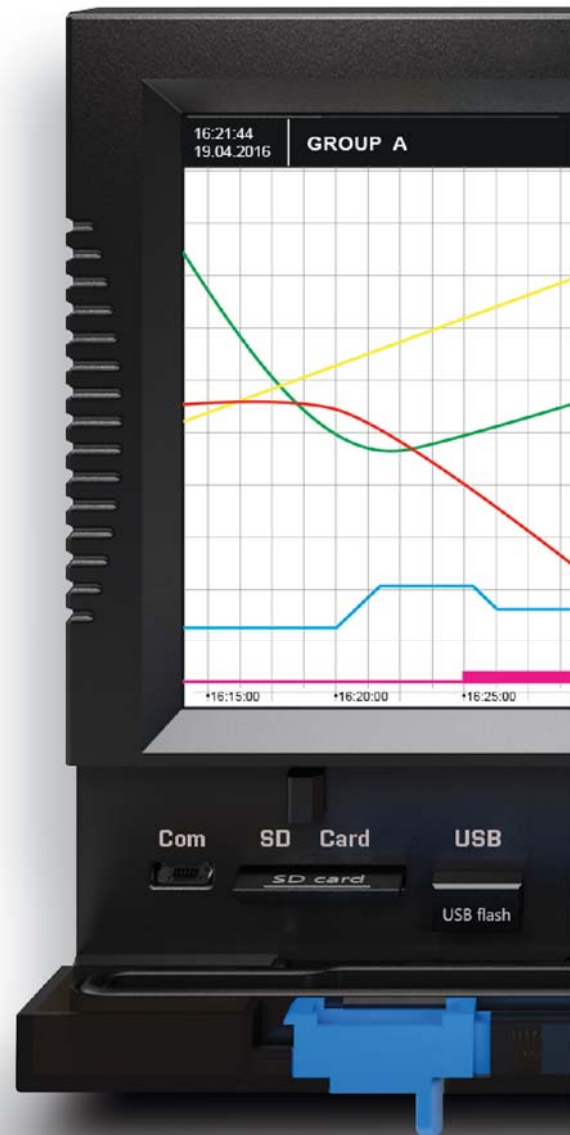


IN.10 8x digital input
12...250 V AC/DC



IN.12 12x counter/frequency
< 10 kHz
IN.13 2x UP/DW counter/frequency/IRC
< 1 MHz

IN



Under the hinged cover are accessible

micro
USB

SD
card
< 32 GB

USB
Type A
flash disc
 ≤ 32 GB



Digital outputs

2x



RS 485
Standard equipment



OUT.1 4x relay with a switch-over contact
OUT.2 8x relay with a switch-on contact



OUT.3 8x open collector, NPN
OUT.4 16x open collector, NPN with common terminal
OUT.5 8x open collector, PNP



OUT.6 6x SSR



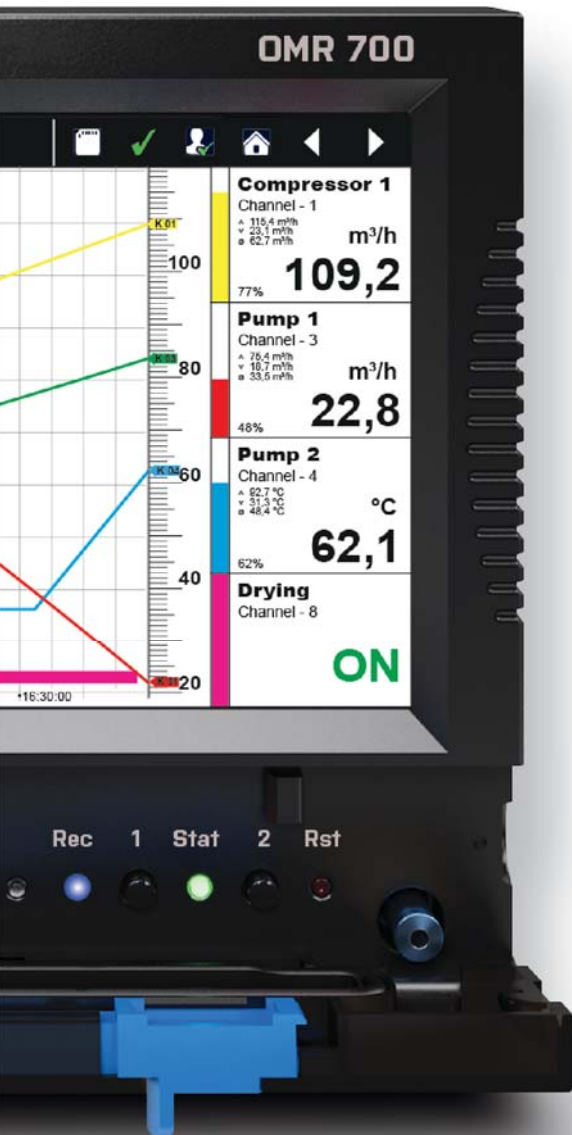
A0.1 2x Anal. output, galv. isolated
A0.2 4x Anal. output, galv. isolated



DO.1 1x PROFIBUS



DO.2 1x PROFINET



OUT >

the following elements and the Stylus

LED
run
error
record

Buttons
menu
record
reset

Stylus



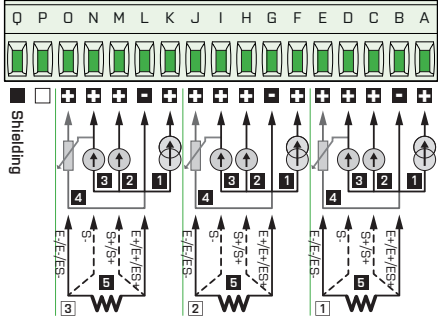
Recorder can hold up to 8 cards in any combination



CONNECTION – INPUT

IN.1 3x Universal input

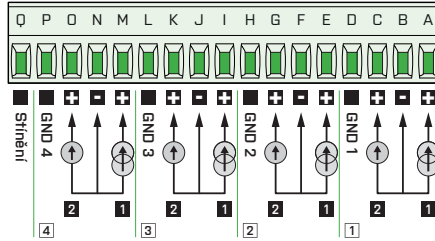
IN.01



- 1 PM: 0...5/20 mA/4...20 mA
- 2 PM: ± 2 V/ ± 5 V/ ± 10 V/ ± 40 V
- 3 DC: ± 60 / ± 150 / ± 300 / ± 1200 mV
T/C: J/K/T/E/B/S/R/N/L
- 4 DU: Lin. potentiometer (> 500 Ω)
- 5 OHM: 0...0,1/0,3/1/3/10/30 k Ω
- 6 RTD: Pt 50/100/500/1 000
Cu: Cu 50/100
Ni: Ni 1 000/10 000

IN.2 4x PM input U-I

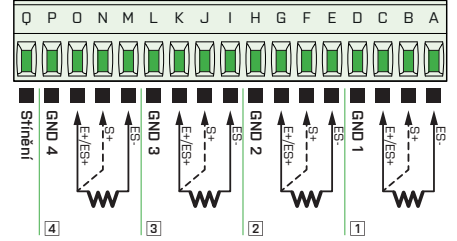
IN.02



- 1 DC - I: ± 5 / ± 20 mA, 0...20/4...20 mA
- 2 DC - U: ± 2 / ± 5 / ± 10 / ± 40 V, 0...2/5/10/40 V

IN.3 4x RTD input

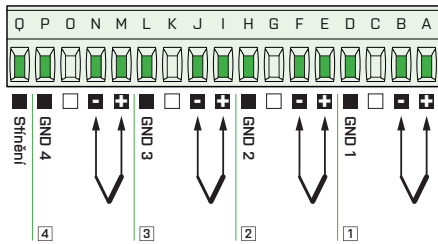
IN.03



- OHM: 0...0,1/0,3/1/3/10/30 k Ω
- RTD: Pt 50/100/500/1 000
- Cu: Cu 50/100
- Ni: Ni 1 000/10 000

IN.4 4x T/C input

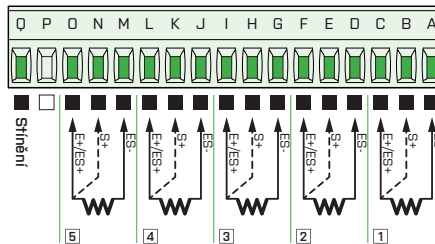
IN.04



T/C: J/K/T/E/B/S/R/N/L

IN.5 5x RTD input

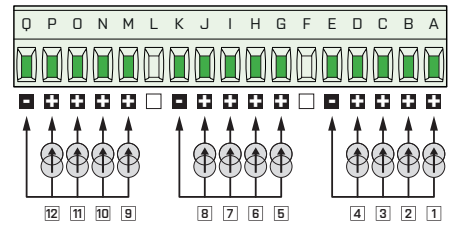
IN.05



- OHM: 0...0,1/0,3/1/3/10/30 k Ω
- RTD: Pt 50/100/500/1 000
- Cu: Cu 50/100
- Ni: Ni 1 000/10 000

IN.6 12x DC input, current

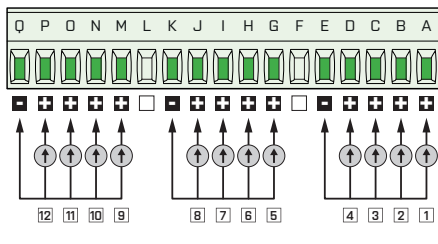
IN.06



DC - I: 0...5 mA/0...20 mA/4...20 mA/ ± 5 / ± 20 mA/

IN.7 12x DC input, voltage

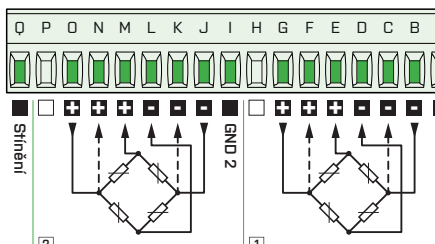
IN.07



DC - U: 0...2 V/0...5 V/0...10 V/0...40 V/ ± 2 / ± 5 / ± 10 / ± 40 V

IN.8 2x input for strain gauges

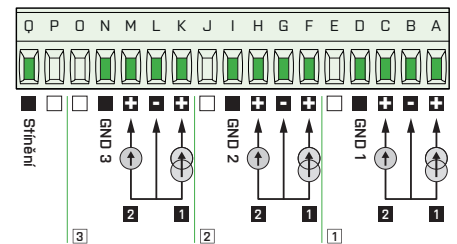
IN.08



DMS: 1...16 mV/V

IN.9 3x PM input U-I

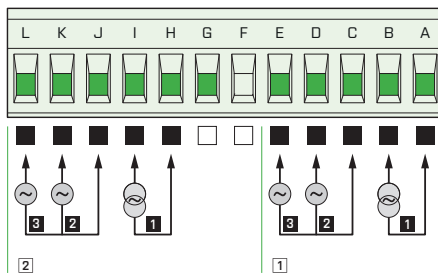
IN.09



- 1 DC - I: 0...20 mA/4...20 mA/ ± 20 mA
- 2 DC - U: 0...5 V/0...10 V/ ± 5 / ± 10 V

IN.10 2x AC/PWR input

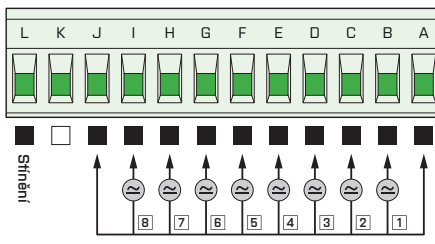
IN.10



- 1 AC - I: 0...60/150/300 mV
0...1/2,5/5 A
- 2 AC - U1: 0...10/250 V
- 3 AC - U2: 0...120/450 V

IN.11 8x Digital input

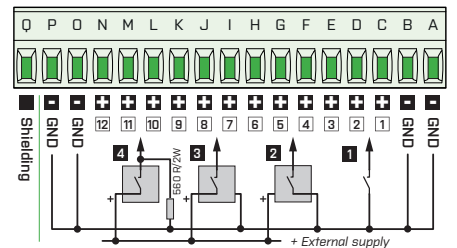
IN.11



AC/DC: 12...250 V AC/DC

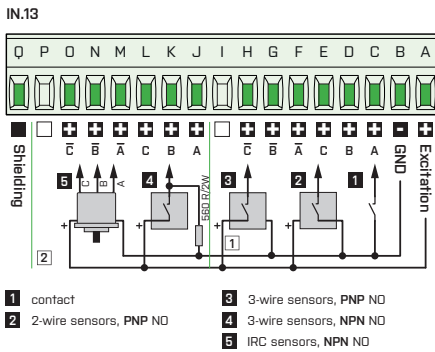
IN.12 12x Pulse input

IN.12

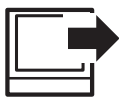
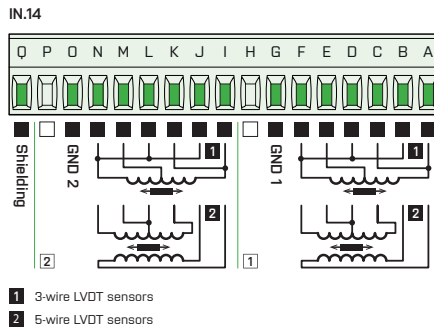


- 1 contact
- 2 2-wire sensors, PNP NO
- 3 3-wire sensors, PNP NO
- 4 3-wire sensors, NPN NO

IN.13 2x Fast pulse input

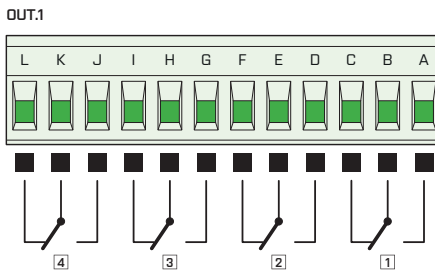


IN.14 2x input for LVDT sensors

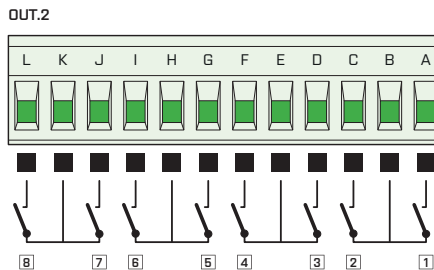


CONNECTION – OUTPUT

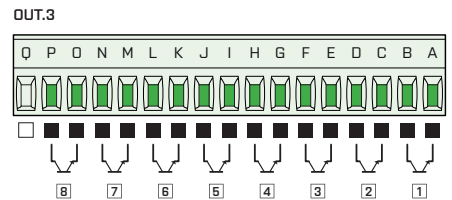
OUT.1 4x Relay, switch-over contact



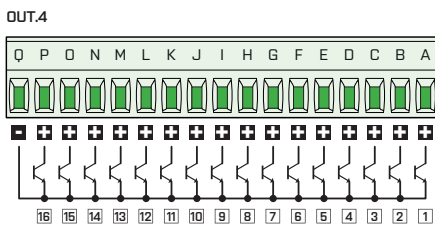
OUT.2 8x Relay, switch-on contact



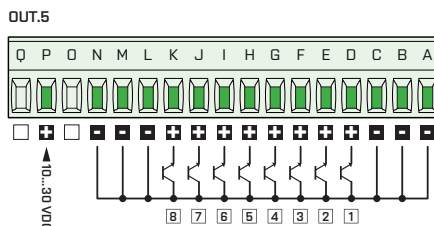
OUT.3 8x OC, NPN



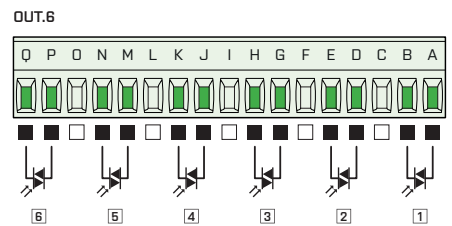
OUT.4 16x OC, NPN



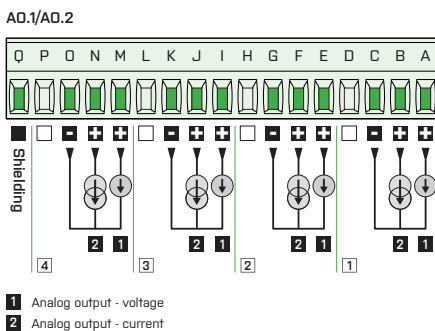
OUT.5 8x OC, PNP



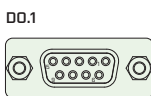
OUT.6 6x SSR



AO.1 2/4x Analogue output

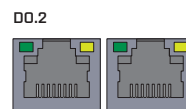


DO.2 1x PROFIBUS



- Pin assignment
- 3 B: Rx/D/TxD-P data reception/transmission, positive
 - 4 CNTR: signal for repeater control
 - 5 DGND: reference potential for data and +5 V
 - 6 VP: +5 V
 - 8 A: Rx/D/TxD-N data reception/transmission, negative

DO.2 1x PROFINET





TECHNICAL DATA

PROJECTION

Display: 5,7" color TFT display with capacitive touch screen
Brightness: adjustable

INSTRUMENT FUNCTIONS

TK: 25 ppm/°C
Accuracy: depending on the measuring card used
Measuring rate: depending on the measuring card used
Accuracy of cold junction measurement: ±1,5°C
Digital inputs: 5x - optional functions
Digital outputs: 2x (open collector) - optional functions
Acoustic signalization: sound module for acoustic signalization with 1,5 W loud speaker
Value recording:
 - into instrument memory (512 MB) with 4 fold compression
 - USB FLASH with support of FAT32 up to 32 GB
 - SD card with support of FAT32 up to 32 GB
RTC: 15 ppm/°C, time-date-value channel/display/nod
Watch-dog: reset after 500 ms
Calibration: at 25°C and 40% of r.h.

COMMUNICATION

Protocols: ASCII, MODBUS RTU, FTP, SMPT
Data format: 8 bits + without parity + 1 stop bit (ASCII)
Rate: 300...230 400 Baud
RS 485: isolated, addressing (max. 31 instruments), Modbus RTU (Master)
Ethernet: 10/100BaseT, secure communication, SMPT, FTP, TCP/IP Modbus (Slave)
Wi-Fi: optional module with standard or industrial temperature range

POWER SUPPLY

Range: 10...30 V AC/DC, ±10%, PF ≥ 0,4, I_{STP} < 75 A/2 ms
 80...250 V AC/DC, ±10%, PF ≥ 0,4, I_{STP} < 45 A/2 ms
Consumption: < 30 VA/< 30 W
Power supply is protected by a fuse inside the instrument.

MECHANIC PROPERTIES

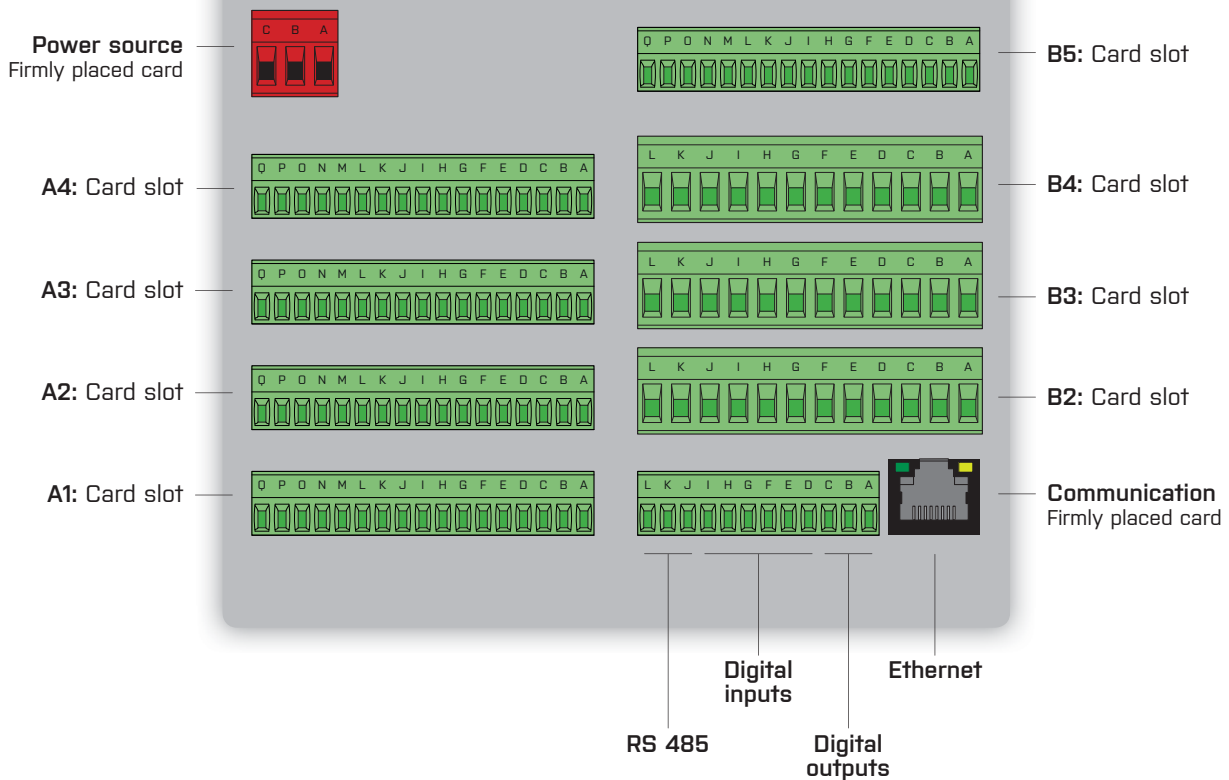
Material: Noryl GFN2 SE1, non-flammable UL 94 V-I
Dimensions: 150 x 150 x 80 mm
Depth behind panel: 85 mm
Panel cut-out: 138 x 138 mm
Securing lid: the front lid can be sealed


OPERATING CONDITIONS

Connection: connector terminal board, conductor cross-section < 1,5/2,5 mm²
Stabilisation period: within 15 minutes after switch-on
Working temperature: -20°...60°C
Storage temperature: -20°...85°C
Cover: IP64 (front panel only)
Overvoltage category: EN 61010-1, A2
Dielectric strength: 4 kVAC after 1 min. between power supply and input
 4 kVAC after 1 min. betw. power supply and data/anal. output
 4 kVAC after 1 min. between input and relay output
 2,5 kVAC after 1 min. between input and data/anal. output
Insulation resistance: for pollution degree II, measurement category III.
 Instrument power supply > 670 V (ZI), 300 V (DI)
 Input, output, PN > 300 V (ZI), 150 V (DI)
EMC: EN 61326-1

PI - Primary insulation, DI - Double insulation

CONNECTOR LAYOUT



 Slots A are designated for fast analogue cards, slot B5 is designated for cards DO.1/2. There are no restrictions for placement of other cards.

ORDER CODE

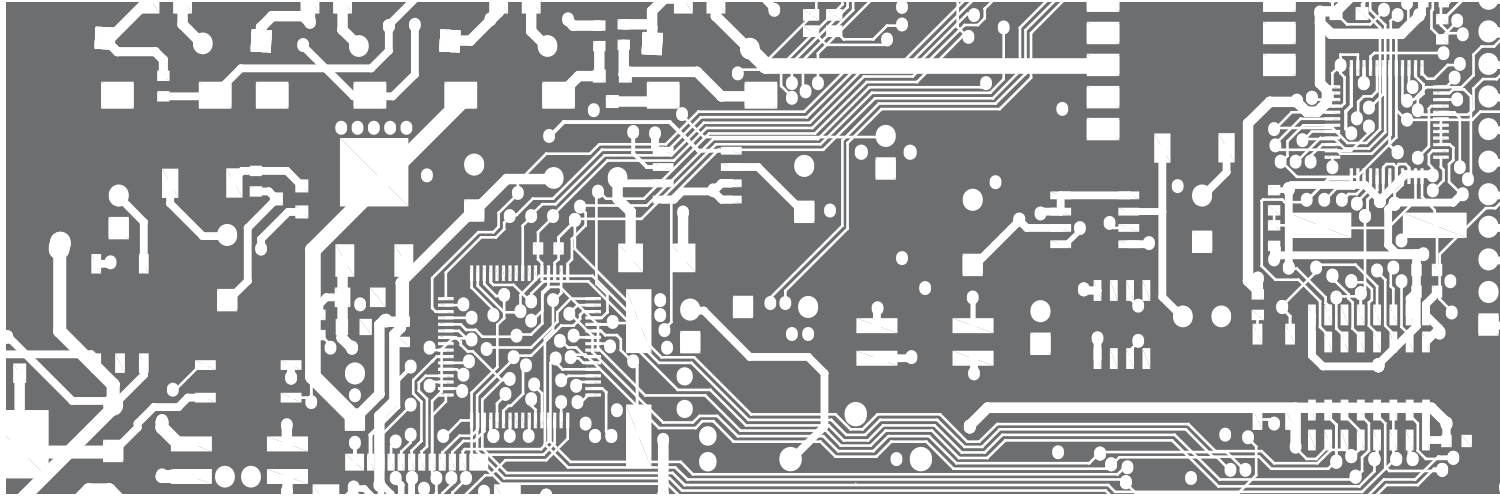
OMR 700

- - -

Power source	10...30 V AC/DC, isolated	0																		
	80...250 V AC/DC, isolated	1																		
Wi-Fi module	no		0																	
	yes, standard temper. range		1																	
	yes, industrial temper. range		2																	
Features, see table „Card types“																				
Here list the selected cards																				
Specification	customer version, do not fill in																			00

Card types

Order code	Designation	Description	Range	Accuracy (of range)	Transmitter (resolution)	Rate (meas./s)	Isolated channels
0	PW.0	Power supply	10...30 V AC/DC				yes
1	PW.1	Power supply	80...250 V AC/DC				yes
A	IN.1	3x Universal input	DC: $\pm 60/\pm 150/\pm 300/\pm 1\ 200$ mV PM: 0...5 mA/0...20 mA/4...20 mA/ ± 2 V/ ± 5 V/ ± 10 V/ ± 40 V OHM: 0...100 Ω /0...1 k Ω /0...10 k Ω /0...30 k Ω RTD: Pt 50/100/Pt 500/Pt 1 000 Cu: Cu 50/Cu 100 Ni: Ni 1 000/Ni 10 000 T/C: J/K/T/E/B/S/R/N/L DU: Linear potentiometer [min. 500 Ω]	$\pm 0,15\%$	24 bits	< 320	yes
B	IN.2	4x power/voltage input	0...5 mA/0...20 mA/4...20 mA/ ± 2 V/ ± 5 V/ ± 10 V/ ± 40 V	$\pm 0,2$	16 bits	< 320	yes
C	IN.3	4x RTD	Pt 50/100/1000, Ni 1000/10 000, Cu 50/100	$\pm 0,2$	16 bits	< 320	yes
D	IN.4	4x T/C	J/K/T/E/B/S/R/N/L	$\pm 0,2$	16 bits	< 320	yes
E	IN.5	5x RTD	Pt 50/100/1000, Ni 1000/10 000, Cu 50/100	$\pm 0,2$	16 bits	< 320	no
F	IN.6	12x power input	± 5 mA/ ± 20 mA/4...20 mA	$\pm 0,2$	16 bits	< 320	no
G	IN.7	12x voltage input	± 2 V/ ± 5 V/ ± 10 V/ ± 40 V	$\pm 0,2$	16 bits	< 320	no
H	IN.8	2x input for strain gauges with pow. supply	1...16 mV/V	$\pm 0,02$	24 bits	< 1 000	yes
I	IN.9	3x precise power/voltage input	0/4...20 mA, $\pm 5/\pm 10$ V	$\pm 0,02$	24 bits	< 1 000	yes
J	IN.10	2x voltage [V_{RMS}], power [A_{RMS}], freq. [Hz] with calculation of Q, S, cos fi	input U: 0...10 V/0...120 V/0...250 V/0...450 V input I: 0...60 mV/0...150 mV/0...300 mV/0...1 A/0...2,5 A/0...5 A	$\pm 0,3\%$		< 10	yes
K	IN.11	8x analogue/digital input	12...250 V AC/DC			< 1 ms	no
L	IN.12	12x counter/frequency	0...30 V, PNP/NPN/contact, adjustable comparison levels, input frequency 0,1 Hz...10 kHz				no
M	IN.13	2x UP/D, IRC with power supply	5/24 V, TTL/Line, adjustable comparison levels, input frequency 0,1 Hz...1 MHz				no
N	IN.14	2x input for LVDT sensors	3/5/6-wire connection, 1/3/5 VAC with frequency 2,5/5/10 kHz	$\pm 0,02$	24 bits	< 1 000	yes
P	OUT.1	4x relay with switch-over contact	250 VAC/30 VDC, 3 A			< 10 ms	
Q	OUT.2	8x relay with switch-on contact	250 VAC/30 VDC, 3 A			< 10 ms	
R	OUT.3	8x open collector, NPN	30 VDC/100 mA			< 0,2 ms	
S	OUT.4	16x open collector, NPN common terminal	30 VDC/100 mA			< 0,2 ms	
T	OUT.5	8x open collector, PNP	30 VDC/700 mA			< 0,2 ms	
U	OUT.6	6x SSR	250 VAC, 1 A			< 0,2 ms	
V	A0.1	2x Analogue output	0...2/5/10 V, ± 10 V, 0...5 mA, 0/4...20 mA [comp. < 600 Ω /12 V]	$\pm 0,1\%$		< 1 ms	yes
W	A0.2	4x Analogue output	0...2/5/10 V, ± 10 V, 0...5 mA, 0/4...20 mA [comp. < 600 Ω /12 V]	$\pm 0,1\%$		< 1 ms	yes
Y	DO.1	PROFIBUS					
Z	DO.2	PROFINET					



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